

HESEA - ACE

SPECIAL

PRINTER

REPRINTS.

REASON

5-6-84

568 6302

PRINTER SPEEDS

The numbers in parentheses beneath the printer model numbers indicate the advertised printing speed in characters per second (cps). The numbers in the shaded columns are the times (minutes:seconds) it took the printers to complete specific tests. The numbers in the adjacent, unshaded columns are the approximate printing speeds in characters per second for each test.

	Diablo 630 (31.8)	NEC 7710 (55)	NEC 3510 (35)	Transtar 140 (40)	Brother HR-25 (13)	Brother HR-15 (23)	Olivetti Praxis 41
Shannon Test: (50 characters wide), 573 characters plus CR/LF	00:15 38.2	00:13 44.1	00:20 28.6	00:17 33.7	00:28 20.5	00:44 13.0	01:24 6.8
Shannon Test (60 characters wide), 573 characters plus CR/LF	00:16 35.8	00:13 44.1	00:20 28.6	00:18 31.8	00:29 19.8	00:45 12.7	01:25 6.7
First-Order English Random Approximation (50 characters wide), 1000 characters plus CR/LF	00:28 35.7	00:24 41.7	00:35 28.6	00:31 32.3	00:50 20.0	01:18 12.8	02:30 6.7
Fourth-Order Shakespeare Random Approximation (60 characters wide), 796 characters plus CR/LF	00:23 34.6	00:19 41.9	00:29 27.4	00:25 31.8	00:41 19.4	01:03 12.6	01:58 6.7
First-Order Unix On-Line Manual Random Approximation (60 characters wide), 1000 plus CR/LF	00:31 32.3	00:24 41.7	00:37 27.0	00:31 32.3	00:52 19.2	01:16 13.2	02:28 6.8
Spreadsheet Simulation (20 rows of eight 10-character columns with five-digit random numbers and spaces), 1600 characters plus CR/LF	00:29 55.2	00:27 59.3	00:38 42.1	00:39 41.0	01:30 17.8	01:33 17.2	03:22 7.9

	Epson MX-80 (80)	Epson RX-80 (100)	Epson FX-80 (160)	Diablo 11 (100)	Okidata 82A (120)	Okidata 92 (160)	IDS 480 (110)	Gemini 10X (120)
Bench 1—Print A on 50 consecutive lines	00:18 2.8	00:17 2.9	00:13 3.8	00:06 6.2	00:11 4.5	00:10 3.1	00:12 4.2	00:12 3.8
Bench 2—Print a string of 10 As on 50 lines	00:23 21.8	00:22 22.7	00:16 31.2	00:13 38.4	00:12 41.7	00:12 41.7	00:18 31.2	00:17 29.4
Bench 3—Print a string of 20 As on 50 lines	00:30 33.3	00:27 37.0	00:21 47.6	00:18 55.6	00:16 62.5	00:15 66.7	00:20 50.0	00:22 45.5
Bench 4—Print a string of 40 As on 50 lines	00:43 46.6	00:39 51.3	00:29 69.0	00:29 69.0	00:24 83.3	00:21 95.2	00:30 66.7	00:33 60.6
Bench 5—Print a string of 60 As on 50 lines	00:55 54.5	00:51 58.8	00:37 81.1	00:40 75.0	00:32 93.8	00:28 107.1	00:39 76.9	00:42 71.4
Bench 6—Print a string of 80 As on 50 lines	01:06 58.8	00:62 64.5	00:45 88.9	00:51 78.4	00:40 100.0	00:36 111.1	00:48 83.3	00:52 76.9
Bench 7—Print a string of 10 spaces and 60 As on 50 lines	00:56 63.6	00:51 68.6	00:37 94.6	00:41 85.4	00:32 109.4	00:28 125	00:39 89.7	00:43 81.4
Bench 8—Print 10 times 5 strings of 50 spaces and 10 As with different displacement	00:32 93.8	00:32 93.7	00:31 96.8	00:21 142.8	00:26 115.4	00:18 166.7	00:32 93.7	00:36 83.3
Bench 9—Print a string of 8 alternate groups of 5 spaces and 5 1s on 50 lines	01:05 61.5	00:60 66.7	00:43 93.0	00:53 75.5	00:39 102.6	00:35 114.3	00:46 87.0	00:51 78.4
Bench 10—Same as Bench 1 but with emphasized mode, e.g. 18 by 9 matrix	01:36 31.2	01:30 33.3	01:01 49.2	N/A	N/A	N/A	N/A	01:09 43.5
Bench 11—Same as Bench 1 but in double-pass mode, i.e., 8 by 18 matrix	02:33 19.6	02:04 24.2	01:47 28.0	N/A	N/A	01:13 41.1	N/A	01:44 28.8
Bench 12—Same as Bench 1 but in correspondence mode	03:53 12.9	03:28 14.4	02:36 19.2	02:35 19.4	N/A	01:52 26.8	00:52 57.7	02:36 19.2
Bench 13—Same as Bench 1 but in compressed mode	01:04 46.9	01:01 49.2	00:44 68.2	00:41 73.2	00:32 93.8	00:29 103.4	00:39 76.9	00:48 62.5
Bench 14—Same as Bench 1 but in double-pass mode	01:07 29.9	01:02 32.3	00:41 48.8	00:50 40.0	00:41 73.2	00:37 54.1	00:49 40.8	00:57 35.1

INSIDE FACTS

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MATT CANTRELL
PRINTER CARE

Last month we talked about disk-drives, and how to keep them working properly. Since they have moving parts, the element of wear must be considered. Those moving parts are much more likely to go out to lunch than computers themselves, which are composed of solid-state devices subject mainly to the threat of irregularities in the supply of electric power. The other class of computer product with extra vulnerability because of its moving parts is the printer. In this month's column we will discuss some things to think about concerning your printer. Assuming that most of you have dot-matrix machines, so I'll limit my remarks to that type.

The hardest-working part of your printer is the printhead. Its needles move with incredible speed and precision as they print the dots that form letters on the paper, and considering how long they last, on average, printheads deserve a lot of respect from us reformed pencil-pushers. One way to show that respect is to use fresh ribbons. There is not much danger to the printhead in continuing to use tired ribbons, which for some printers can be a bit costly. The temptation is to cut corners by re-inking used ribbons, or by spraying them with a solvent to release more ink. I haven't seen any studies on this, but I should point out that one component in ribbon ink is in fact a lubricant for the printhead needles, and if you use anything other than a new replacement ribbon you run the risk of either gumming up the printhead or depriving it of adequate lubrication.

Another factor in printhead longevity is heat. Depending on your printer's head design, it may be one that naturally generates heat as it idles. Of course, it generates heat while it's printing too, and that's why most of the mass of a printhead is actually a heat-sink to carry away that heat. But when it is printing, it is also picking up lubricant from the ribbon ink which cools in the same way 10W40 oil does in your car's engine. Clearly, a couple hours of idling time is not crucial, but unlike your computer, which can remain powered up 24 hours a day, your printer should be switched off when you are not actually involved in a computing session.

CHAOS 2-84

A third factor also involves the printhead, but somewhat indirectly. As the printhead whizzes back and forth over the paper, poking it thousands of times, paper dust is produced, which can build up in obstructive amounts. The simple solution, of course, is gently to vacuum this dust from time to time. While you are at it, run the soft brush attachment over your keyboard too. Why not be generous?

The above precautions pertain to normal use of your printer, but there are some further precautions to take whenever you must move or transport your printer. I am thinking here about Epson printers, but other brands probably have similar sensitivities. One, remove the ribbon cartridge during the move, to avoid accidental, prolonged contact with the printhead. Two, slip a piece of paper into the carriage. This guards against damage to the reed which senses when the printer is out of paper. This is similar to the need to insert a cardboard 'dummy disk' into a drive when it is transported: you don't want your read-write head rattling around if you can help it.

Finally, here's a warning especially about Epson printers which may also apply to other brands: never try to roll the paper backwards when the printer is powered up. This can strip the tractor gears and you will have a problem on your hands. With the power off this is alright, though you will have to pull the paper backwards yourself to accomplish this.

I don't pretend that these are going to be new ideas for veteran micro-nuts, but if you have just acquired your first printer you will want to keep these tips in mind. Today's dot-matrix printers are truly marvelous machines for the money, but they won't run forever without some kind of regular attention. See you next month!

Matt Cantrell



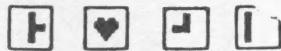
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PRINTER CONTROL CODES

by Greg Waldorf



Many people are unaware of the things their printers can do merely because they don't know how to use control codes. The methods I give will work with any normal printer.

Control codes are sent through BASIC to the printer and once the printer is in the new mode it will remain there even if you turn your computer off to put in your word processor.

Codes are listed in your manual (usually) as follows: Purpose: Set the print pitch to condensed print mode. Format: CHR\$(27) CHR\$(66) CHR\$(3).

So what you would do is this: in BASIC type ?CHR\$(27) RET. You will then see the escape symbol. Now type ?CHR\$(66) Ret, and you will see a B under it. Now for last one type ?CHR\$(3) Ret. You will see a graphics symbol produced by a control C. Now turn on your printer and type LPRINT "\$B%", BUT don't type what I just told you to. I cannot type the escape symbol or the graphics symbol with my word processor so where you just read \$ hit escape and where I put the % type control C then hit Ret. Your printer should advance one line.

If you were using an Epson or Gemini you would now be in the condensed mode and anything you now print will come out in the condensed mode until you turn the printer off. I repeat you can and this is the important part turn off your computer and take out BASIC to put in your word processor and the computer will stay in the mode you put it in.

For those who use AtariWriter I am sure that you know some of the functions do not work with non-Atari printers. For example if you had an Atari printer anything typed in inverse would be underlined but not so with an Epson. Do not fear though there is a new printer driver that works with AtariWriter that allows you to use functions such as double columns and underlining with most of the major printers. A few of them are Epson, Gemini, Okidata, and several others. The program is from APX you can call 1-800-672-1404 for a catalog.

I hope I have cleared up some questions for you and good luck.



TTC JAN 84

** PRINTER COLUMN **
by Tom Garren

I was recently asked by another computer user if there was a simple way to control the printer without having to memorize the various control and escape codes, or constantly have a manual at your side while working. After thinking about it for a short while I decided to write a simple BASIC program to let you select the more common features on the printer from a series of menus. Since I use a Prowriter, the program is written specifically for that printer, but it would be a simple matter to change the codes to those of any printer.

There is one other thing that makes this program a little bit unique. I actually wrote it on an IBM PC, therefore the code was in Microsoft BASIC. The translation to Atari Microsoft BASIC was very simple, involving only the actual printer calls. As far as I know, this is our first program listing in Atari Microsoft BASIC.

If you don't have Microsoft BASIC, do not despair, but be patient. A listing for the same program in good old Atari BASIC will appear in next month's newsletter. Also both versions of the program will be placed in the club library by mid-January.

To use the program, simply type it in and RUN it under Microsoft BASIC. The various selection menus should guide you through with no problem. If you do encounter any problems, please feel free to call me.

Now for the listing:

```
10 REM PROWRITER PRINTER SETUP PROGRAM
20 REM BY TOM GARREN
30 REM V. 1.8 DEC. 82, 1983
40 REM ATARI MICROSOFT BASIC VERSION
50 CLS
60 PRINT "PROWRITER SETUP PROGRAM"
70 PRINT " BY TOM GARREN"
80 FOR A=1 TO 1700:NEXT A
90 OPEN#7,"P:OUTPUT
100 CLS
110 REM MAIN MENU
120 PRINT "ENTER 1 TO SELECT CHARACTER SET"
130 PRINT "ENTER 2 TO SELECT FONT"
140 PRINT "ENTER 3 TO SET LEFT MARGIN"
150 PRINT "ENTER 4 TO SELECT STANDARD OR DOUBLE WIDTH CHARACTERS"
160 PRINT "ENTER 5 TO SELECT CHARACTER ENHANCEMENT"
170 PRINT "ENTER 6 TO SELECT UNDERLINE PRINTING"
180 PRINT "ENTER 7 TO SELECT LINE SPACING"
190 PRINT "ENTER 8 TO SELECT BI OR UNIDIRECTIONAL PRINTING"
200 PRINT "ENTER 9 TO EXIT"
210 LINE INPUT Y$:CLS
220 IF Y$="1" THEN 400
230 IF Y$="2" THEN 600
240 IF Y$="3" THEN 800
250 IF Y$="4" THEN 900
260 IF Y$="5" THEN 1000
270 IF Y$="6" THEN 1100
280 IF Y$="7" THEN 1200
290 IF Y$="8" THEN 1300
300 IF Y$="9" THEN 1400
310 GOTO 120
400 REM SELECT CHARACTER SET
410 PRINT "ENTER 1 FOR U.S."
420 PRINT "ENTER 2 FOR GREEK"
430 PRINT "ENTER 3 FOR BLOCK GRAPHICS"
440 PRINT "PRESS RETURN FOR NO CHANGE"
450 LINE INPUT Y$
460 IF Y$="1" THEN X$=" " :GOTO 510
470 IF Y$="2" THEN X$="#" :GOTO 510
480 IF Y$="3" THEN X$="%" :GOTO 510
490 IF LEN(Y$)=0 THEN 100
500 PRINT "INVALID ENTRY":GOTO 400
510 PRINT#7,CHR$(27);X$:CLS:GOTO 100
600 REM SELECT FONT
610 PRINT "ENTER 1 FOR PICA"
620 PRINT "ENTER 2 FOR ELITE"
630 PRINT "ENTER 3 FOR PROPORTIONAL"
640 PRINT "ENTER 4 FOR CONDENSED"
650 PRINT "PRESS RETURN FOR NO CHANGE"
```

```

660 LINE INPUT Y$
670 IF Y$="1" THEN X$="N":GOTO 730
680 IF Y$="2" THEN X$="E":GOTO 730
690 IF Y$="3" THEN X$="P":GOTO 730
700 IF Y$="4" THEN X$="Q":GOTO 730
710 IF LEN(Y$)=0 THEN 100
720 PRINT "INVALID ENTRY":GOTO 600
730 PRINT#7,CHR$(27);X$:CLS:GOTO 100
800 REM CHANGE LEFT MARGIN SETTING
810 PRINT "ENTER LEFT MARGIN VALUE"
820 PRINT "PRESS RETURN FOR NO CHANGE"
830 CLEAR:LINE INPUT Y$
840 IF LEN(Y$)=0 THEN 100
850 PRINT#7,CHR$(27);"L";Y$
860 CLS:GOTO 100
900 REM SET STANDARD OR DOUBLE WIDTH CHARACTERS
910 PRINT "ENTER 1 FOR STANDARD WIDTH"
920 PRINT "ENTER 2 FOR DOUBLE WIDTH"
930 PRINT "PRESS RETURN FOR NO CHANGE"
940 CLEAR:LINE INPUT Y$
950 IF Y$="1" THEN X$=CHR$(15):GOTO 990
960 IF Y$="2" THEN X$=CHR$(14):GOTO 990
970 IF LEN(Y$)=0 THEN 100
980 PRINT "INVALID ENTRY":GOTO 910
990 PRINT#7,X$:CLS:GOTO 100
1000 REM SELECT/DESELECT ENHANCED PRINT
1010 PRINT "ENTER 1 FOR NORMAL INTENSITY"
1020 PRINT "ENTER 2 FOR ENHANCED PRINT"
1030 PRINT "PRESS RETURN FOR NO CHANGE"
1040 CLEAR:LINE INPUT Y$
1050 IF LEN(Y$)=0 THEN 100
1060 IF Y$="1" THEN X$=CHR$(34):GOTO 1090
1070 IF Y$="2" THEN X$="!":GOTO 1090
1080 PRINT "INVALID ENTRY": GOTO 1000
1090 PRINT#7,CHR$(27);X$:CLS:GOTO 100
1100 REM SELECT/DESELECT UNDERLINE PRINTING
1110 PRINT "ENTER 1 FOR UNDERLINE PRINTING"
1120 PRINT "ENTER 2 TO DISABLE UNDERLINE PRINTING"
1130 PRINT "PRESS RETURN FOR NO CHANGE"
1140 CLEAR:LINE INPUT Y$
1150 IF Y$="1" THEN X$="X":GOTO 1190
1160 IF Y$="2" THEN X$="Y":GOTO 1190
1170 IF LEN(Y$)=0 THEN 100
1180 PRINT "INVALID ENTRY":GOTO 1100
1190 PRINT#7,CHR$(27);X$:CLS:GOTO 100
1200 REM SELECT LINE SPACING
1210 PRINT "ENTER 1 FOR 8 LINES PER INCH"
1220 PRINT "ENTER 2 FOR 6 LINES PER INCH"
1230 PRINT "PRESS RETURN FOR NO CHANGE"
1240 LINE INPUT Y$
1250 IF Y$="1" THEN X$="B":GOTO 1290
1260 IF Y$="2" THEN X$="A":GOTO 1290
1270 IF LEN(Y$)=0 THEN 100
1280 PRINT "INVALID ENTRY":GOTO 1200
1290 PRINT#7,CHR$(27);X$:CLS:GOTO 100
1300 REM SELECT BI OR UNIDIRECTIONAL PRINTING
1310 PRINT "ENTER 1 FOR BIDIRECTIONAL PRINTING"
1320 PRINT "ENTER 2 FOR UNIDIRECTIONAL PRINTING"
1330 PRINT "PRESS RETURN FOR NO CHANGE"
1340 LINE INPUT Y$
1350 IF Y$="1" THEN X$="]":GOTO 1390
1360 IF Y$="2" THEN X$="[":GOTO 1390
1370 IF LEN(Y$)=0 THEN 100
1380 PRINT "INVALID ENTRY":GOTO 1300
1390 PRINT#7,CHR$(27);X$:CLS:GOTO 100
1400 REM EXIT PROGRAM
1410 PRINT "ENTER 1 TO RETURN TO BASIC"
1420 PRINT "ENTER 2 TO EXIT TO SYSTEM"
1430 LINE INPUT Y$
1440 IF Y$="1" THEN 1470
1450 IF Y$="2" THEN 1480
1460 GOTO 100
1470 CLS:NEW
1480 DOS

```

I hope you have fun with this little program. Next month I will also share with you a hardware project, ie. the gadget I built to transfer the program from the PC to the Atari. (You didn't really think I typed it twice did you?).

THE T.C.C. NEWS
The Newsletter of
THE TRIANGLE COMPUTER CLUB
An Organization of ATARI Computer Users

February.....1984
Volume 3 Issue 2

** PRINTER COLUMN **

by Tom Garren

As I promised last month, this newsletter contains the Atari BASIC version of my Prowriter setup program. It is in the club library so you don't have to type it in unless you really need practice at the keyboard.

Remember, this program gives you only the more common functions of the Prowriter.

To use the program, simply type it in and RUN it under Atari BASIC. The various selection menus should guide you through with no problem. If you do encounter any problems, please feel free to call me.

Now for the listing:

```
10 REM PROWRITER PRINTER SETUP PROGRAM
20 REM BY TOM GARREN
30 REM V. 2.0 JAN. 82, 1984
40 REM ATARI BASIC VERSION
50 PRINT ":";POKE 82,0
60 PRINT "PROWRITER SETUP PROGRAM"
70 PRINT " BY TOM GARREN"
80 FOR A=1 TO 1200:NEXT A
90 DIM X$(1):DIM Y$(3)
100 PRINT ":"
110 REM MAIN MENU
120 PRINT "ENTER 1 TO SELECT CHARACTER SET"
130 PRINT "ENTER 2 TO SELECT FONT"
140 PRINT "ENTER 3 TO SET LEFT MARGIN"
150 PRINT "ENTER 4 TO SELECT DOUBLE WIDTH"
160 PRINT "ENTER 5 TO SELECT ENCHANCED CHARACTERS"
170 PRINT "ENTER 6 TO SELECT UNDERLINE PRINTING"
180 PRINT "ENTER 7 TO SELECT LINE SPACING"
190 PRINT "ENTER 8 TO SELECT BI OR UNIDIRECTIONAL"
200 PRINT "ENTER 9 TO EXIT"
210 INPUT Y$:PRINT ":"
220 IF Y$="1" THEN 400
230 IF Y$="2" THEN 600
240 IF Y$="3" THEN 800
250 IF Y$="4" THEN 900
260 IF Y$="5" THEN 1000
270 IF Y$="6" THEN 1100
280 IF Y$="7" THEN 1200
290 IF Y$="8" THEN 1300
300 IF Y$="9" THEN 1400
310 GOTO 120
400 REM SELECT CHARACTER SET
410 PRINT "ENTER 1 FOR U.S."
420 PRINT "ENTER 2 FOR GREEK"
430 PRINT "ENTER 3 FOR BLOCK GRAPHICS"
440 PRINT "PRESS RETURN FOR NO CHANGE"
450 INPUT Y$
460 IF Y$="1" THEN X$=" " :GOTO 510
470 IF Y$="2" THEN X$=" " :GOTO 510
480 IF Y$="3" THEN X$="#" :GOTO 510
490 IF LEN(Y$)=0 THEN 100
500 PRINT "INVALID ENTRY":GOTO 400
510 LPRINT CHR$(27);X$;PRINT "":GOTO 100
600 REM SELECT FONT
610 PRINT "ENTER 1 FOR PICA"
620 PRINT "ENTER 2 FOR ELITE"
630 PRINT "ENTER 3 FOR PROPORTIONAL"
640 PRINT "ENTER 4 FOR CONDENSED"
650 PRINT "PRESS RETURN FOR NO CHANGE"
660 INPUT Y$
670 IF Y$="1" THEN X$="N":GOTO 730
680 IF Y$="2" THEN X$="E":GOTO 730
690 IF Y$="3" THEN X$="P":GOTO 730
700 IF Y$="4" THEN X$="Q":GOTO 730
710 IF LEN(Y$)=0 THEN 100
720 PRINT "INVALID ENTRY":GOTO 600
730 LPRINT CHR$(27);X$;PRINT "":GOTO 100
```

```
800 REM CHANGE LEFT MARGIN SETTING
810 PRINT "ENTER LEFT MARGIN VALUE, 3 DIGITS"
820 PRINT "PRESS RETURN FOR NO CHANGE"
830 INPUT Y$
840 IF LEN(Y$)=0 THEN 100
850 LPRINT CHR$(27); "L"; Y$
860 PRINT "":GOTO 100
900 REM SET STANDARD OR DOUBLE WIDTH CHARACTERS
910 PRINT "ENTER 1 FOR STANDARD WIDTH"
920 PRINT "ENTER 2 FOR DOUBLE WIDTH"
930 PRINT "PRESS RETURN FOR NO CHANGE"
940 INPUT Y$
950 IF Y$="1" THEN X$=CHR$(15):GOTO 990
960 IF Y$="2" THEN X$=CHR$(14):GOTO 990
970 IF LEN(Y$)=0 THEN 100
980 PRINT "INVALID ENTRY":GOTO 910
990 LPRINT X$;PRINT "":GOTO 100
1000 REM SELECT/DESELECT ENHANCED PRINT
1010 PRINT "ENTER 1 FOR NORMAL INTENSITY"
1020 PRINT "ENTER 2 FOR ENHANCED PRINT"
1030 PRINT "PRESS RETURN FOR NO CHANGE"
1040 INPUT Y$
1050 IF LEN(Y$)=0 THEN 100
1060 IF Y$="1" THEN X$=CHR$(34):GOTO 1090
1070 IF Y$="2" THEN X$="!":GOTO 1090
1080 PRINT "INVALID ENTRY":GOTO 1000
1090 LPRINT CHR$(27);X$;PRINT "":GOTO 100
1100 REM SELECT/DESELECT UNDERLINE PRINTING
1110 PRINT "ENTER 1 FOR UNDERLINE PRINTING"
1120 PRINT "ENTER 2 TO DISABLE UNDERLINE PRINTING"
1130 PRINT "PRESS RETURN FOR NO CHANGE"
1140 INPUT Y$
1150 IF Y$="1" THEN X$="X":GOTO 1190
1160 IF Y$="2" THEN X$="Y":GOTO 1190
1170 IF LEN(Y$)=0 THEN 100
1180 PRINT "INVALID ENTRY":GOTO 1100
1190 LPRINT CHR$(27);X$;PRINT "":GOTO 100
1200 REM SELECT LINE SPACING
1210 PRINT "ENTER 1 FOR 8 LINES PER INCH"
1220 PRINT "ENTER 2 FOR 6 LINES PER INCH"
1230 PRINT "PRESS RETURN FOR NO CHANGE"
1240 INPUT Y$
1250 IF Y$="1" THEN X$="B":GOTO 1290
1260 IF Y$="2" THEN X$="A":GOTO 1290
1270 IF LEN(Y$)=0 THEN 100
1280 PRINT "INVALID ENTRY":GOTO 1200
1290 LPRINT CHR$(27);X$;PRINT "":GOTO 100
1300 REM SELECT BI OR UNIDIRECTIONAL PRINTING
1310 PRINT "ENTER 1 FOR BIDIRECTIONAL PRINTING"
1320 PRINT "ENTER 2 FOR UNIDIRECTIONAL PRINTING"
1330 PRINT "PRESS RETURN FOR NO CHANGE"
1340 INPUT Y$
1350 IF Y$="1" THEN X$="]":GOTO 1390
1360 IF Y$="2" THEN X$="[";GOTO 1390
1370 IF LEN(Y$)=0 THEN 100
1380 PRINT "INVALID ENTRY":GOTO 1300
1390 LPRINT CHR$(27);X$;PRINT "":GOTO 100
1400 REM EXIT PROGRAM
1410 PRINT "ENTER 1 TO RETURN TO BASIC"
1420 PRINT "ENTER 2 TO EXIT TO SYSTEM"
1430 INPUT Y$
1440 IF Y$="1" THEN 1470
1450 IF Y$="2" THEN 1480
1460 GOTO 100
1470 PRINT "":NEW
1480 DOS
```

***** PRINTER CODE HELP

By Gerry Stotts

I would like to explain some of the jargon associated with printers for the novice. If you already know your printer well, skip this article.

The term "backspace" means to move the print head to the left one space. This normally only applies in the unidirectional print mode. Use this to create a new character by double printing two characters on the same spot on the paper, etc.

Pica means 10 characters per inch. Elite means 12 characters per inch. In other words, 10 or 12 characters can be printed in every horizontal inch of printer paper. Compressed means 17 characters per inch. Expanded print means 2 times larger than whichever print width is selected. For instance if compressed and expanded are selected, 8.5 characters per inch results.

Line spacing is normally set at 6 lines per inch or 1/6 inch spacing. This means that 6 lines will fit on each vertical inch of printer paper. Most printers also allow 8 lines per inch (1/8" spacing). Most printers also allow finer adjustments, such as 1/144" or 1/72", for special occasions.

I hope this might help some of you that are novice types when it comes to printers. I will try to give you some more pointers next newsletter. This is the result of talking to some of you and realizing that the code sheets alone do not give you all the information you need to get started the first few times with your new printer! Sorry to those whose intelligence was insulted by this article.

L/SM ACE

***** PRINTER CODES

By Gerry Stotts

I have received two more control codes for this month. Thanks to our own Dan Rohr for the FX-80 codes and his help checking them out. A big thanks to Richard Reaser from the West LA AUG for the fourteen pages of control code information for the C-Itoh Starwriter! The Starwriter is a daisywheel printer. The commands are close to the Diablo printer commands. Thanks to both of you! Anyone else with printers other than the ones previously presented, please send your codes. If you have corrections to the codes I have presented, please get them to me.

(SEE COMMANDS
SHEETS FOLLOWING.)

C. ITOH "PROWRITER" 8510 PRINTER COMMANDS

<u>DEC</u>	<u>KEYSTROKE</u>	<u>FUNCTION</u>
8	CTRL H	BACKSPACE (INCREMENTAL MODE ONLY...must be followed by char.)
9	CTRL I	HORIZ TAB (to next preprogrammed tab pos.)
10	CTRL J	FORWARD LINE FEED
11	CTRL K	VERTICAL TAB (preprogrammed in VFU)
12	CTRL L	FORM FEED
13	CTRL M	CARRIAGE RETURN or SELECT PRINTER
14	CTRL N	EXPANDED PRINT ON
15	CTRL O	EXPANDED PRINT OFF
17	CTRL Q	SELECT MODE (SW1-5 must be OFF)
18	CTRL R	ENLARGED CHAR MODE-JA7-ON
19	CTRL S	DESELECT8 PRINTER
20	CTRL T	ENLARGED CHAR MODE-JA7-OFF
24	CTRL X	CANCELS PRINT LINE
29	ESC/CTRL ↓	LOAD VFU
30	ESC/CTRL +	TERMINATES VFU SETTING
31n	ESC/CTRL → CHR\$(n)	VERTICAL TAB TO CH(n)
34	CHR\$(34)	SELECT PRINTER (DC1)
27 33	ESC !	ENHANCED (BOLDFACE) CHARACTER MODE - ON
27 34	ESC CHR\$(34)	ENHANCED (BOLDFACE) CHARACTER MODE - OFF
27 35	ESC *	INTERNAL GRAPHICS (GRAPHIC SYMBOLS) SELECTED
27 36	ESC \$	DEFAULT CHAR SET (ASCII [Turns off GRAPHICS or GREEK])
27 38	ESC &	GREEK CHARACTER SET SELECTED
27 48	ESC (n1,n2...	SET HORIZ TABS (Max=16 tabs)
27 41	ESC) n1,n2...	CLEAR HORIZ TABS
27 50	ESC 2	CLEAR ALL HORIZ TABS
27 60	ESC <	SETS LOGIC-SEEKING MODE (BI-directional)
27 62	ESC >	SETS INCREMENTAL MODE (UNI-directional)
27 65	ESC A	SETS 6 LINES/INCH
27 66	ESC B	SETS 8 LINES/INCH
27 69	ESC E	ELITE (12 cpi)
27 70	ESC F nnn	DOT ADDRESSING
27 76	ESC L n1n2n3	SETS LEFT MARGIN (e.g. L015 sets left margin 15 spaces in)
27 78	ESC N	PICA (10 cpi) or TURNS OFF CONDENSED
27 80	ESC P	PROPORTIONAL SPACING
27 81	ESC Q	CONDENSED (17 cpi)
27 82	ESC R nnn	CHARACTER REPEAT (nnn times)
27 83	ESC S n1n2n3n4	SETS DOT-IMAGE GRAPHICS
27 84	ESC T n1n2	SETS LINE SPACING TO n/144 INCH (e.g. T16 sets 16/144 inch)
27 86	ESC V	DOT COLUMN REPEAT
27 88	ESC X	UNDERLINING ON
27 89	ESC Y	UNDERLINING OFF
27 91	ESC [SETS INCREMENTAL MODE (UNI-directional)
27 93	ESC]	SETS LOGIC-SEEKING MODE (BI-directional)
27 102	ESC f	FORWARD LINE FEED (DEFAULT) SELECTED
27 114	ESC r	REVERSE LINE FEED SELECTED

Note: CHR\$(34) = ("") OR SHIFT 2 (accessible ONLY with CHR\$(34) using BASIC)

Compiled by Merrill Stalls on the MICROLINE 84

ITOH STARWRITER (TEC FP-1500) PRINTER COMMANDS

<u>DEC</u>	<u>KEYSTROKE</u>	<u>FUNCTION</u>
8	CTRL H	BACKSPACE (Serial mode only)
9	CTRL I	HORIZONTAL TAB (Serial mode only)
10	CTRL J	LINE FEED
11	CTRL K	VERTICAL TAB (Line printer mode only)
12	CTRL L	FORM FEED
13	CTRL M	CARRIAGE RETURN
17	CTRL N	PRINTER ENABLED (Line printer mode only)
19	CTRL P	PRINTER DISABLED (Line printer mode only)
24	CTRL X	CLEARs BUFFER (Line printer mode only)
27 (LIST)	ESC (LIST)	TAB SET LIST ("LIST" represents the absolute horizontal position [d1d2])
27 9 (n)	ESC CTRL I (n)	ABSOLUTE HORIZONTAL TAB (Digit number)
27 11 (n)	ESC CTRL K (n)	ABSOLUTE VERTICAL TAB (Line number)
27 26 73	ESC CTRL Z I	RESET
27 30 (m)	ESC + (m)	SETS VERTICAL SPACE, MIN 1/48 INCH
27 31 (n)	ESC + (n)	SETS HORIZONTAL SPACE, MIN 1/120 INCH
27 48	ESC 0	SETS RIGHT MARGIN
27 49	ESC 1	SETS HORIZONTAL TAB
27 50	ESC 2	CLEARs ALL HORIZONTAL TABs
27 51	ESC 3	1/60 INCH SPACE MODE
27 52	ESC 4	TURNS ESC 3 AND ESC 6 OFF
27 53	ESC 5	FORWARD PRINT
27 54	ESC 6	BACKWARD PRINT
27 56	ESC 8	CLEAR TAB AT PRESENT POSITION
27 57	ESC 9	SETS LEFT MARGIN
27 67 (d1d2)	ESC C	ABSOLUTE HORIZONTAL TAB (Digit number)
27 68	ESC D	HALF LINE FEED DOWN
27 69 (d1d2)	ESC E (d1d2)	SETS HORIZONTAL SPACE, MIN 1/120 INCH
27 70 (d1d2)	ESC F (d1d2)	SETS FORM LENGTH (Digit number)
27 71	ESC G	1/120 INCH SPACE MODE
27 72 (n1n2n3)	ESC H	RELATIVE HORIZONTAL TAB
27 76 (d1d2)	ESC L (d1d2)	SETS VERTICAL SPACE, MIN 1/48 INCH
27 80 (d1d2)	ESC P (d1d2)	ABSOLUTE VERTICAL TAB (Line number)
27 85	ESC U	HALF LINE FEED UP
27 86 (n1n2n3)	ESC V (n1n2n3)	RELATIVE VERTICAL TAB

NOTE: For 'd', 'm', and 'n', see the appropriate table in the printer manual.

EPSON FX-850 PRINTER COMMANDS

DBC

	<u>KEYSTROKE</u>	<u>FUNCTION</u>
7	CTRL ,	USED TO TERMINATE TAB SETTING PROGRAMMING OF ESC-B AND ESC-D.
8	CTRL G	BUZZER SOUNDS FOR .1 SECOND.
9	CTRL H	BACKSPACE
10	CTRL I	HORIZONTAL TAB (See (-D))
11	CTRL J	LINE FEED
12	CTRL K	VERTICAL TAB (See (-B))
13	CTRL L	FORM FEED (top of next page).
14	CTRL M	CARRIAGE RETURN
	CTRL N	TURES ON DOUBLE WIDTH CHARACTER PRINT MODE TO END OF LINE (unless cancelled by CTRL-T).
15	CTRL O	TURES ON COMPRESSED MODE 17 CPI
17	CTRL Q	ENABLES PRINTER (Normal mode).
18	CTRL R	CANCELL COMPRESSED MODE
19	CTRL S	DISABLES PRINTER (Use CTRL-Q to enable).
20	CTRL T	CANCELL DOUBLE WIDTH MODE.
24	CTRL X	CLEARs PRINTER TEXT BUFFER.
127	ESC TAB	DELETES LAST CHARACTER IN PRINTER BUFFER (►)
27 45 48/49	ESC - 0/1	UNDERLINE MODE (t-1=on, t-0=off).
27 47 n	ESC / CHR\$(n)	SELECTS CHANNEL n (See (-b)).
27 48	ESC 0	SETS LINE SPACING TO 1/8 INCH (8 LPI).
27 49	ESC 1	SETS LINE SPACING TO 7/72 INCH (approx. 10 LPI).
27 50	ESC 2	SETS LINE SPACING TO DEFAULT 1/6 INCH (6 LPI).
27 51 n	ESC 3 CHR\$(n)	SETS LINE SPACING TO n/216.
27 52	ESC 4	TURES ON ITALICS MODE.
27 53	ESC 5	TURES OFF ITALICS MODE.
27 56	ESC 8	PRINTER IGNORS PAPER OUT SENSOR.
27 57	ESC 9	CANCELS "t8" MODE (enables paper out switch to function).
27 60	ESC (TURES ON ONE-LINE UNIDIRECTIONAL MODE.
27 64	ESC @	RESETS PRINTER TO INITIAL POWER ON CONDITION.
27 65 n	ESC A CHR\$(n)	SETS LINE SPACING TO n/72 INCH.
27 66 n1-n16	ESC B	SETS UP TO 16 VERTICAL TABS (tBn1n2...n16 [0<n1<n2...<n16] CTRL-, to terminate)
27 67 n	ESC C CHR\$(n)	SETS FORM LENGTH TO n LINES (tCn [0<n<128] resets top of form [TOF]).
27 67 0 n	ESC C CTRL-, n	SET FORM LENGTH TO n INCHES (tCn [0<n<23] resets TOF).
27 68 n1-n32	ESC D n1-n32	SET HORIZONTAL TABS AND CLEAR CURRENT TABS (tDn1...n32 [n=1 to max char. per line] CTRL-, to terminate).
27 69	ESC E	SELECTS EMPHASIZE MODE.
27 70	ESC F	CANCELL EMPHASIZE MODE.
27 71	ESC G	SELECT DOUBLE STRIKE MODE.
27 72	ESC H	CANCELL DOUBLE STRIKE, SUPERSCRIPT, AND SUBSCRIPT MODES.
27 74 n	ESC J CHR\$(n)	ONE TIME LINE FEED OF n/216 INCH WITHOUT CR (0<n<256).
27 75	ESC K n1 n2	TURES ON SINGLE DENSITY GRAPHICS.
27 76	ESC L n1 n2	TURES ON DOUBLE DENSITY GRAPHICS.
27 77	ESC M	TURES ON ELITE MODE.
27 78 n	ESC N CHR\$(n)	SETS SKIP OVER PERFORATION TO n LINES (0<n<128).
27 79	ESC O	TURES SKIP OVER PERFORATION OFF
27 80	ESC P	TURES OFF ELITE MODE.
27 81 n	ESC Q CHR\$(n)	SETS RIGHT MARGIN (n(max char. per line)).
27 82 n	ESC R CHR\$(n)	SELECTS INTERNATIONAL CHARACTER SET (n=0 to 8).
27 83 48	ESC S 0	SUBSCRIPT IS SELECTED.
27 83 49	ESC S 1	SUPERSCRIPT MODE IS SELECTED.
27 84	ESC T	RESETS SUPERSCRIPT & SUBSCRIPT
27 85 48/49	ESC U 0/1	CONTINUOUS UNI-DIRECTIONAL PRINT MODE (tU1=on, tU0=off).
27 87 48/49	ESC W 0/1	CONTINUOUS DOUBLE-WIDTH PRINT MODE (tW1=on, tW0=off).
27 106 n	ESC J CHR\$(n)	ONE-TIME REVERSE n/216" LINE FEED (no CR).
27 108 n	ESC I CHR\$(n)	SETS LEFT MARGIN AT n (n(max char per line))
27 112 48/49	ESC p 0/1	PROPORTIONAL MODE (tp1=on, tp0=off).

EPSON MX-80 (WITH GRAPHTRAX) PRINTER COMMANDS

<u>DEC</u>	<u>KEYSTROKE</u>	<u>FUNCTION</u>
7	CTRL G	BELL CHARACTER
8	CTRL H	BACKSPACE
9	CTRL I	EXECUTE HORIZONTAL TAB
10	CTRL J	LINE FEED
11	CTRL K	EXECUTE VERTICAL TAB
12	CTRL L	FORM FEED
13	CTRL M	CARRIAGE RETURN
14	CTRL N	SHIFT OUT EXPANDED CHAR. MODE
15	CTRL O	SHIFT IN CONDENSED CHAR. MODE
15 14	CTRL O CTRL N	CONDENSED/EXPANDED CHAR. MODE
17	CTRL Q	SELECT PRINTER
18	CTRL R	CANCELS CONDENSED MODE
19	CTRL S	DESELECTS PRINTER
20	CTRL T	CANCELS EXPANDED MODE
27 48	ESC 0	SETS 8 LINES/INCH
27 50	ESC 2	SETS 6 LINES/INCH
27 56	ESC 8	DESELECTS PAPER END DETECTOR
27 57	ESC 9	SELECTS PAPER END DETECTOR
27 65	ESC A n	SETS n/72" LINE SPACING
27 56	ESC B n1 n2 n3...	SETS VERTICAL TABS (MUST END W/NULL AND CR)
27 67	ESC C n	SETS FORM LENGTH TO n
27 68	ESC D n1 n2 n3...	SETS HORIZONTAL TABS (MUST END W/NULL AND CR)
27 69	ESC E	EMPHASIZED PRINT MODE
27 70	ESC F	CANCELS EMPHASIZED PRINT
27 71	ESC G	DOUBLE STRIKE MODE
27 72	ESC H	CANCELS DOUBLE STRIKE
27 75	ESC K n1 n2	480 BIT IMAGE MODE
27 76	ESC L n1 n2	960 BIT IMAGE MODE
27 78	ESC N	SETS SKIP-OVER PERFORATION
27 79	ESC O	RELEASE SKIP-OVER PERFORATION
27 81	ESC Q n	SETS COLUMN WIDTH
27 82	ESC R	SELECTS INTERNATIONAL CHARACTER SET FROM AMONG 8

* Note: Did not seem to work!

Compiled by Gerald Stultz on the MICROLINE 84

MANNESMANN TALLY SPIRIT 80 PRINTER COMMANDS

	<u>KEYSTROKE</u>	<u>FUNCTION</u>
6	CTRL ,	USED TO TERMINATE TAB SETTING PROGRAMMING OF ESC-B AND ESC-D.
7	CTRL G	BUZZER SOUNDS FOR 1/3 SECOND.
8	CTRL H	BACKSPACE, BUFFER DATA IS PRINTED THEN BACKSPACES ONE SPACE
9	CTRL I	MOVES THE PRINT HEAD TO THE NEXT TAB SET POSITION.
10	CTRL J	LINE FEED, THE BUFFER DATA IS PRINTED, THEN PAPER ADVANCED ONE LINE.
11	CTRL K	VERTICAL TAB, (SINGLE LINE FEED).
12	CTRL L	PAPER IS FED TO THE TOP OF FORM (top of next page).
13	CTRL M	CARRIAGE RETURN, PRINTS BUFFER AND RETURNS PRINthead TO THE LEFT.
14	CTRL N	TURNs ON DOUBLE WIDTH CHARACTER PRINT MODE TO END OF LINE (unless cancelled by CTRL-T).
15	CTRL O	TURNs ON COMPRESSED MODE 17 CPI (does not work with EMPHASIZED).
18	CTRL R	CANCELL COMPRESSED MODE (buffer is emptied).
20	CTRL T	CANCELL DOUBLE WIDTH MODE.
127	ESC TAB	DELETES LAST CHARACTER IN PRINTER BUFFER (►)
27 45 CHR\$(n)	ESC - CHR\$(n)	ALL DATA AFTER THIS CODE IS UNDERLINED(n)0 example: (-CTRL A).
27 45 0	ESC - CTRL-,	CANCELL UNDERLINING MODE (-~).
27 48	ESC 0	SETS LINE SPACING TO 1/8 INCH (8 LPI).
27 49	ESC 1	SETS LINE SPACING TO 7/72 INCH (approx. 10 LPI).
27 50	ESC 2	SETS LINE SPACING TO DEFAULT 1/6 INCH (6 LPI).
27 51 n	ESC 3 CHR\$(n)	SETS LINE SPACING TO n/216 (0(n(256).
27 52	ESC 4	SELECT ITALICS MODE.
27 53	ESC 5	SELECTS THE STANDARD CHARACTER SET.
27 56	ESC 8	PRINTER IGNORES PAPER OUT SENSOR.
27 57	ESC 9	CANCELS "48" MODE (enables paper out switch to function).
27 64	ESC @	RESETs PRINTER TO INITIAL POWER ON CONDITION.
27 65 n	ESC A CHR\$(n)	SETS LINE SPACING TO n/72 INCH (0(n(86).
27 66 n1-n16	ESC B	SETS UP TO 16 VERTICAL TABS ((Bn1n2...n16~ [0(n1(n2... (n16] CTRL-, to terminate)
27 67 CHR\$(n)	ESC C CHR\$(n)	SETS FORM LENGTH TO n LINES ((Cn [0(n(128] resets top of form [TOF]).
27 67 0 n	ESC C 0 n	SETS FORM LENGTH TO n INCHES ((C0n [0(n(23] resets TOF).
27 68 n1-n28	ESC D n1-n28	SET HORIZONTAL TABS AND CLEAR CURRENT TABS ((Dn1...n28~ [n=1 to max char. per line] CTRL-, to terminate).
27 69	ESC E	SELECTS EMPHASIZE MODE.
27 70	ESC F	CANCELL EMPHASIZE MODE.
27 71	ESC G	SELECT DOUBLE STRIKE MODE.
27 72	ESC H	CANCELL DOUBLE STRIKE, SUPERSCRIPT, AND SUBSCRIPT MODES.
27 74 CHR\$(n)	ESC J CHR\$(n)	ONE TIME LINE FEED OF n/216 INCH (0(n(256).
27 75	ESC K n1 n2	640 DOTS PER 7.5" LINE.
27 76	ESC L n1 n2	1280 DOTS PER 7.5" LINE.
27 78 CHR\$(n)	ESC N CHR\$(n)	SETS SKIP OVER PERFORATION TO n LINES (0(n(128).
27 79	ESC O	RESET SKIP OVER PERFORATION TO ZERO LINES.
27 81 n	ESC Q CHR\$(n)	SETS COLUMN WIDTH (0(n(max char. per line).
27 82 n	ESC R CHR\$(n)	SELECTs INTERNATIONAL CHARACTER SET (n=0 to 7).
27 83 0	ESC S CTRL-,	SUPERSCRIPT IS SELECTED.
27 83 1	ESC S CTRL-A	SUBSCRIPT MODE IS SELECTED.
27 84	ESC T	RESETs SUPERSCRIPT, SUBSCRIPT AND UNIDIRECTIONAL PRINTING.
27 85 1	ESC U CTRL-A	UNI-DIRECTIONAL PRINT MODE.
27 85 0	ESC U CTRL-,	BI-DIRECTIONAL PRINT MODE.
27 87 1	ESC W CTRL-A	DOUBLE-WIDTH PRINT MODE (stays on until turned off).
27 87 0	ESC W CTRL-,	CANCELL DOUBLE-WIDTH PRINT MODE.

NEC8023A PRINTER COMMANDS

DEC	KEYSTROKE	FUNCTION
8	CTRL H	BACKSPACE (INCREMENTAL MODE ONLY...must be followed by char.)
9	CTRL I	HORIZ TAB (moves head to next tab pos.)
10	CTRL J	FORWARD LINE FEED
11	CTRL K	VERTICAL TAB
12	CTRL L	FORM FEED
13	CTRL M	CARRIAGE RETURN or SELECT PRINTER
14	CTRL N	EXPANDED PRINT ON
15	CTRL O	EXPANDED PRINT OFF
17	CTRL Q	SELECT MODE (SW1-5 must be OFF)
18	CTRL R	ENLARGED CHAR MODE-JA7-ON
19	CTRL S	DESELECTS PRINTER
20	CTRL T	ENLARGED CHAR MODE-JA7-OFF
24	CTRL X	CANCELS PRINT LINE
29	ESC/CTRL +	LOAD VFU
30	ESC/CTRL +	TERMINATES VFU SETTING
31n	ESC/CTRL → CHR\$(n)	VERTICAL TAB TO CH(n)
34	CHR\$(34)	SELECT PRINTER (DC1)
27 33	ESC !	ENHANCED CHARACTER MODE - ON
27 34	ESC CHR\$(34)	ENHANCED CHARACTER MODE - OFF
27 35	ESC #	INTERNAL GRAPHICS (CHAR GEN) SELECTED
27 36	ESC \$	DEFAULT CHAR SET (Turns off GRAPHICS or GREEK)
38	ESC &	GREEK CHARACTER SET SELECTED
27 40	ESC (n1,n2...n16 SET HORIZ TABS (Max=16)
27 41	ESC)	n1,n2...n16 CLEAR HORIZ TABS
27 50	ESC 2	CLEAR ALL HORIZ TABS
27 65	ESC A	SETS 6 LINES/INCH
27 66	ESC B	SETS 8 LINES/INCH
27 69	ESC E	ELITE (12 cpi)
27 76	ESC L,n	n2,n1,n0 SETS LEFT MARGIN (e.g. L015 sets left margin 15 spaces in)
27 78	ESC N	PICA (10 cpi) or TURNS OFF CONDENSED
27 80	ESC P	PROPORTIONAL SPACING
27 81	ESC Q	CONDENSED (17 cpi)
27 83	ESC S	n3...n0 SETS DOT-IMAGE GRAPHICS
27 84	ESC T,n1n2	n1n0 SETS LINE SPACING TO n/144 INCH (e.g. T16 sets 16/144 inch)
27 88	ESC X	UNDERLINING ON
27 89	ESC Y	UNDERLINING OFF
27 91	ESC [SETS INCREMENTAL MODE (UNI-directional)
27 93	ESC]	SETS LOGIC-SEEKING MODE (BI-directional)
27 97	ESC a,n	SELECT (n) DEVICE
27 102	ESC f	FORWARD LINE FEED (DEFAULT) SELECTED
27 114	ESC r	REVERSE LINE FEED SELECTED

Compiled by Gerald Stultz on the MICROLINE 84

OKIDATA MICROLINE 84 PRINTER COMMANDS

<u>DEC</u>	<u>KEYSTROKE</u>	<u>FUNCTION</u>
8	CTRL H	BACKSPACE (INCREMENTAL MODE ONLY..must be followed by char.)
9	CTRL I	HORIZ TAB (to next preprogrammed tab pos.)
10	CTRL J	FORWARD LINE FEED (moves paper up one line)
11n	CTRL K CHR\$(n)	VERTICAL TAB (paper feed of selected channel (n) of VFU [CHR\$(49 TO 60) 1 TO (12 ch max 54 tabs max)])
12	CTRL L	FORM FEED (top of form)
13	CTRL M	CARRIAGE RETURN (return printhead to left)
14	CTRL N	ENTER INTERNAL GRAPHIC CHAR. SET (7-bit code only)
15	CTRL O	EXIT INTERNAL GRAPHIC CHAR. SET (7-bit code only)
17	CTRL Q	SELECT PRINTER
19	CTRL S	DESELECTS PRINTER
20	CTRL T	BEGIN VFU LOAD SEQUENCE (# of spaces first then ch #)
24	CTRL X	CLEAR BUFFER (not valid in incremental mode)
28	ESC/CTRL ↑	DESIGNATES 17 CPI
29	ESC/CTRL ↓	DESIGNATES 12 CPI
30	ESC/CTRL ←	DESIGNATES 10 CPI
31	ESC/CTRL →	DESIGNATES DOUBLE-WIDTH CHARACTERS
27 48	ESC 0	DATA PROCESSING MODE (200 cps)
27 49	ESC 1	CORRESPONDENCE (LETTER) QUALITY (50 cps)
27 50	ESC 2	DOWN-LINE LOADABLE CHAR GEN (design your own!)
27 53	ESC 5	SETS TOF (top of form)
27 54	ESC 6	SETS 6 LINES/INCH
27 56	ESC 8	SETS 8 LINES/INCH
27 67	ESC C	UNDERLINING ON (stops after a CR)
27 68	ESC D	UNDERLINING OFF
27 70	ESC F n1 n2	PAGE LENGTH IN LINES PER PAGE (must be followed by 00 to 99 followed by 15 [TOF])
27 71	ESC G n1 n2	PAGE LENGTH BY 1/2" (followed by 00 to 99 followed by 15 [TOF])
27 72	ESC H	VERTICAL 1/2 DOT EMPHASIZED PRINTING
27 73	ESC I	STOPS EMPHASIZED PRINTING
27 74	ESC J	STARTS SUPERSCRIPT PRINTING
27 75	ESC K	STOPS SUPERSCRIPT PRINTING
27 76	ESC L	STARTS SUBSCRIPT PRINTING
27 77	ESC M	STOPS SUBSCRIPT PRINTING
27 78	ESC N CHR\$(n)	SPACE BETWEEN CHAR IN 1/72" (max=11/72 followed by CHR\$(0 to 11) [may only be used in <u>LETTER QUALITY</u> mode])
27 78 48	ESC N 0	RETURN TO NORMAL INTER-CHARACTER SPACING
27 79	ESC O	INCREMENTAL PRINTING MODE (print one direction only... not all modes allowed...check book)
27 80	ESC P	STOP INCREMENTAL PRINTING
27 82	ESC R	EJECT SINGLE SHEET (cut sheet feeder option)
27 83	ESC S	INSERT ONE SHEET (cut sheet feeder option)
27 84	ESC T	HORIZ 1/2 DOT EMPHASIZED PRINTING (1 to turn off)
27 37 49	ESC × 1	HIGH RES GRAPHICS (144 dpi) (must be followed by b1 b2 #of bytes)
27 37 50	ESC × 2	NORMAL RES GRAPHICS (72 dpi at 10 cpi varies w/cpi) (followed by b1 b2 #of bytes)
27 37 57	ESC × 9	LINE SPACING BY n/144" (followed by CHR\$(n))
27 37 65	ESC × A	LOAD OF DOWN-LINE LOADABLE CHAR GEN (followed by letter to code to recall char [32 to 95 dec. usable] followed by 11 bytes of data for character)
27 11	ESC CTRL K n1 n2	DIRECT LINE SKIP (designated by n1 n2) [not CHR\$(n)]
27 09	ESC CTRL I n1n2n3	HORIZ TAB STOP AT COLUMN NO. n1n2n3 (must be 3 digit number) multiple #'s separated by (,) (must end with CARRIAGE RETURN [CTRL-M])

DEC	KEYSTROKE	FUNCTION
0	CTRL ,	USED TO TERMINATE TAB SETTING PROGRAMMING OF ESC-D AND ESC-P.
7	CTRL G	BUZZER SOUNDS FOR 1/4 SECOND.
8	CTRL H	BUFFER DATA IS PRINTED AND THIS CODE SHIFTS THE PRINT START POSITION TO THE LEFT SIDE BY ONE CHARACTER.
9	CTRL I	MOVES THE PRINT HEAD TO THE NEXT TAB SET POSITION.
10	CTRL J	ONE LINE PAPER-FEED IS DONE AFTER THE BUFFER DATA IS PRINTED.
11	CTRL K	FEED PAPER TO THE NEXT VT POSITION. DEFAULT VALUE IS SET EVERY 6 LINES.
12	CTRL L	PAPER IS FED TO THE PRINT START LINE. (top of next page)
13	CTRL M	CARRIAGE RETURN AND 1 LINE IS FED AUTOMATICALLY.
14	CTRL N	TURNS ON DOUBLE WIDTH CHARACTER PRINT MODE.
15	CTRL O	TURNS ON COMPRESSED MODE 17 CPI.
17	CTRL Q	THIS CODE CAUSES PRINTER TO BE SELECTED.
18	CTRL R	CANCELL COMPRESSED MODE.
19	CTRL S	THIS CODE CAUSES PRINTER TO BE DESELECTED.
20	CTRL T	CANCELL DOUBLE WIDTH MODE.
27 45 1	ESC-CTRL A	ALL DATA AFTER THIS CODE IS UNDERLINED.
27 45 0	ESC-CTRL-,	CANCELL UNDERLINING MODE.
27 48	ESC 0	CHANGE LINE FEED LENGTH TO 1/8 INCH.
27 49	ESC 1	CHANGE LINE FEED LENGTH TO 7/72 INCH.
27 50	ESC 2	CHANGE LINE FEED LENGTH TO 1/8 INCH.
27 51 n	ESC 3 CHR*(n)	CHANGE LINE FEED LENGTH TO n/144 (1 to 127).
27 52	ESC 4	SELECT ITALICS MODE.
27 53	ESC 5	SELECTS THE STANDARD CHARACTER SET.
27 56	ESC 8	PRINTER IGNORES PAPER OUT SENSOR.
27 57	ESC 9	CANCELS "48" MODE (enables paper out switch to function).
27 64	ESC @	RESETS PRINTER TO INITIAL POWER ON CONDITION.
27 65n	ESC A CHR*(n)	LINE FEED TO n/72" (1 to 127).
27 66 1	ESC B CTRL A	SETS 10 CPI. 80 COLUMNS.
27 66 2	ESC B CTRL B	SETS 12 CPI. 96 COLUMNS.
27 66 3	ESC B CTRL C	SETS 17 CPI. 132 COLUMNS.
27 67 n	ESC C CHR*(n)	SETS FORM LENGTH TO n LINES.
27 67 0 n	ESC C 0 CHR*(n)	SETS FORM LENGTH TO n INCHES.
27 68 n	ESC D nn CTRL-	CLEAR CURRENT TAB SET, AND SET NEW TABS.
27 69	ESC E	SELECTS EMPHASIZE MODE.
27 70	ESC F	CANCELL EMPHASIZE MODE.
27 71	ESC G	SELECT DOUBLE STRIKE MODE.
27 72	ESC H	CANCELL DOUBLE STRIKE MODE.
27 74 n	ESC J CHR*(n)	ONE TIME LINE FEED OF n/144 INCH.
27 75	ESC K n1 n2	480 DOT8 PITCH OF BIT-IMAGE-COLUMN-SCAN.
27 76	ESC L n1 n2	960 DOT8 OF PITCH OF BIT-IMAGE-COLUMN-SCAN.
27 77 n	ESC M CHR*(n)	SETS LH-MARGIN.
27 78 n	ESC N CHR*(n)	SETS SKIP OVER PERFORATION TO n LINES.
27 79	ESC O	RESET SKIP OVER PERFORATION TO ZERO LINES.
27 80	ESC P n n n @	SET VT POSITION (VERTICAL TABS).
27 81 n	ESC Q CHR*(n)	SETS RH-MARGIN.
27 82 n	ESC R CHR*(n)	SETS HEADER LINE POSITION n=1 TO 16.
27 83 0	ESC S CTRL-,	SUPERSCRIPT IS SELECTED.
27 83 1	ESC S CTRL A	SUBSCRIPT MODE IS SELECTED.
27 84	ESC T	RESETS SUPERSCRIPT AND SUBSCRIPT MODES.
27 85 1	ESC U CTRL-A	UNI-DIRECTIONAL PRINT MODE.
27 85 0	ESC U CTRL-,	BI-DIRECTIONAL PRINT MODE.
27 86 1	ESC V CTRL-A	BLASHED "ZERO" SELECTED.
27 86 0	ESC V CTRL-,	BLASHED "ZERO" DESELECTED.
27 87 1	ESC W CTRL A	DOUBLE-WIDTH PITCH PRINT MODE IS SELECTED.
27 87 0	ESC W CTRL-,	CANCELL DOUBLE-WIDTH PITCH PRINT MODE.
27 88 1	ESC X CTRL-A	9 X 9 ROM MATRIX SELECTED
27 88 0	ESC X CTRL-,	STANDARD ROM MATRIX SELECTED
27 89 1	ESC Y CTRL A	ENABLE BUZZER BEEP.
27 89 0	ESC Y CTRL-,	DISABLE BUZZER BEEP.
27 90 n	ESC Z CHR*(n)	PROPORTIONAL SPACING SELECTED (n=spacing between char. 1 to 8).
27 90 0	ESC Z CTRL-,	STANDARD CHARACTER SPACING.